

IN THE CLAIMS

Please amend claims 1-20 as follows:

1. (Currently Amended) A storage control device comprising:

a channel adapter which is ~~econnected~~ operatively coupled to a upper device, ~~[[and]]~~ provides ~~a first~~ logical volumes ~~[[to]]~~ for the upper device (called as “upper logical volumes”) and receives data which are sent from the upper device to the ~~first~~ upper logical volumes,

a memory which is ~~econnected~~ operatively coupled to the channel adapter and stores the data ~~exchanged~~ transferred between the upper device and the memory, control information with respect to the data ~~exchanged~~ transferred between the upper device and the memory, and configuration information with respect to the configuration of the storage control device,

a disk adapter which controls reading and writing the data, which are sent from the upper device to the ~~first~~ upper logical volumes, from and onto the memory as being sent to ~~a second~~ logical volumes at least one of which maps is mapped to one of the first upper logical volumes (called as “inner logical volumes”) and is used as a storing region for ~~[[in]]~~ transmission and reception of the data between the channel adapter and the disk adapter,

an interconnection device which ~~econnects~~ operatively couples to the channel adapter, the memory and the disk adapter, and

a plurality of disk devices, which are ~~econnected~~ operatively coupled to the disk adapter, ~~[[on]]~~ in which ~~disk drives~~ the data for ~~[[to]]~~ the ~~second~~ inner logical volumes are written by control of the disk adapter as a data group having a redundant relation, ~~[[and]]~~

wherein a first inner logical volume of the inner logical volumes is mapped to a first upper logical volume of the upper logical volumes,

wherein the channel adapter provides ~~providing at least one~~ a second upper logical volume of the upper logical volumes for control used by the upper device to the upper device, the second upper logical volume ~~for control being~~ is utilized when the configuration information in the memory is read ~~[[from]]~~ by the upper device, ~~[[and]]~~

wherein the channel adapter receives a command including a change-over indication from the upper device sent for the second upper logical volume, and

wherein the channel adapter ~~has having~~ a processor which ~~causes maps other a~~ second inner logical volume of the inner logical volumes instead of the first inner ~~second~~ logical volume ~~to map~~ to the first upper logical volume in response to ~~[[a]] the~~ change-over indication issued from the upper device to the second upper logical volume ~~for control and further causing to operate~~ spindle motors of the plurality of disk drives on which a data group mapped to the ~~other~~ second inner logical volume and having a redundant relation is written.

2. (Currently Amended) The storage control device as set forth in claim 1, wherein the processor of the channel adapter causes to stop the spindle motors of the plurality of disk drives on which the data group mapped to the ~~other~~ second inner logical volume to be changed in response to the change-over indication and having the redundant relation is written.
3. (Currently Amended) The storage control device as set forth in claim 1, wherein the processor of the channel adapter judges whether the spindle motors of the plurality of disk drives are being operated or not, onto which disk drives the data group mapped to the ~~other~~ second inner logical volume designated by the change-over indication and having the redundant relation is written, and if the spindle motors are being operated, the processor causes the operation of the spindle motors to be continued, and if the spindle motors are not operated, causes to operate the spindle motors of the plurality of disk drives on which the data group mapped to the ~~other~~ second inner logical volume and having the redundant relation is written.
4. (Currently Amended) The storage control device as set forth in claim 1, wherein if one mapped to the ~~other~~ second inner logical volume mapped to another first upper logical volume provided to the upper device exists in the plurality of disk drives on which the data group mapped to the second inner logical volume to be changed in response to the change-over indication and having the redundant relation is written, the processor of the channel adapter causes the operation of the plurality of disk drives to be continued, on which disk drives the data group mapped to the second inner logical volume to be changed in response to the change-over indication and having the redundant relation is written.

5. (Currently Amended) The storage control device as set forth in claim 1, wherein if one mapped to the ~~other~~ second inner logical volume mapped to another first upper logical volume provided to the upper device does not exist in the plurality of disk drives on which the data group mapped to the second inner logical volume to be changed in response to the change-over indication and having the redundant relation is written, the processor of the channel adapter causes to stop the operation of the plurality of disk drives on which the data group mapped to the second inner logical volume to be changed in response to the change-over indication and having the redundant relation is written.
6. (Currently Amended) The storage control device as set forth in claim 1, wherein in the case ~~that kind of the~~ the command sent from the upper device to the second upper logical volume ~~for control~~ is a write command, the processor of the channel adapter writes the content of the write command on the second upper logical volume ~~for control~~ and judges the content of the write command to be the change-over indication.
7. (Currently Amended) The storage control device as set forth in claim 1, wherein in the case ~~that kind of the~~ the command sent from the upper device to the second upper logical volume ~~for control~~ is a read command, the processor of the channel adapter judges the read command to be the configuration information and reads the configuration information from the memory to send it to the upper device.
8. (Currently Amended) The storage control device as set forth in claim 1, further comprises a mapping change device which causes the ~~other~~ second inner logical volume instead of the ~~second~~ first inner logical volume to map to the first upper logical volume in response to an indication of the processor of the channel adapter.
9. (Currently Amended) The storage control device as set forth in claim 1, further comprises a power control device, in response to an indication of the processor of the channel adapter, which stops the spindle motors of the plurality of disk drives on which ~~[[the]]~~ a data group mapped to the ~~second~~ first inner logical volume to be changed in response to the change-over indication and having the redundant relation is written, and which operates the spindle motors of the plurality of disk drives on

which the data group mapped to ~~the other~~ second inner logical volume and having the redundant relation is written.

10. (Currently Amended) The storage control device as set forth in claim 1, wherein in the case that the command sent from the upper device is addressed to the first logical volume, the processor of the channel adapter judges the command sent from the upper device to be a command concerning writing or reading of data, and in the case that the command sent from the upper device is addressed to the second upper logical volume ~~for control~~, the processor of the channel adapter judges the command sent from the upper device to be a command concerning the control information.
11. (Currently Amended) A method for controlling a storage control device, comprising
 - providing a storage control device including a channel adapter which is ~~connected~~ operatively coupled to a upper device, ~~[[and]]~~ provides ~~a first~~ logical volumes ~~[[to]]~~ for the upper device (called as "upper logical volumes") and receives data which are sent from the upper device to the ~~first upper~~ logical volumes,
 - a memory which is ~~connected~~ operatively coupled to the channel adapter and stores the data ~~exchanged~~ transferred between the upper device and the memory, control information with respect to the data ~~exchanged~~ transferred between the upper device and the memory, and configuration information with respect to the configuration of the storage control device,
 - a disk adapter which controls reading and writing the data, which are sent from the upper device to the ~~first upper~~ logical volumes, from and onto the memory as being sent to ~~a second~~ logical volumes at least one of which maps is mapped to one of the ~~first upper~~ logical volumes (called as "inner logical volumes") and is used as a storing region for ~~[[in]]~~ transmission and reception of the data between the channel adapter and the disk adapter,
 - an interconnection device which ~~connects~~ operatively couples to the channel adapter, the memory and the disk adapter, and
 - a plurality of disk devices, which are ~~connected~~ operatively coupled to the disk adapter, ~~[[on]]~~ in which ~~disk drives~~ the data for ~~[[to]]~~ the ~~second inner~~ logical volumes are written by control of the disk adapter as a data group having a redundant relation,

wherein the channel adapter provides ~~at least one~~ a second upper logical volume of the upper logical volumes for control used by the upper device to the upper device, the second upper logical volume ~~for control being~~ is utilized when the configuration information in the memory is read ~~[[from]]~~ by the upper device; ~~[[~~, and]]

mapping a first inner logical volume of the inner logical volumes to a first upper logical volume of the upper logical volumes;

receiving by the channel adapter a command including a change-over indication from the upper device sent for the second upper logical volume;

causing mapping by a processor of the channel adapter ~~other~~ a second inner logical volume instead of the first inner ~~second~~ logical volume ~~to map~~ to the first upper logical volume in response to ~~[[a]]~~ the change-over indication issued from the upper device to the second upper logical volume ~~for control~~; and

causing operating by the channel adapter ~~to operate~~ spindle motors of a plurality of disk drives on which a data group mapped to the ~~other~~ second inner logical volume and having redundant relation is written.

12. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, further comprising causing by the channel adapter to stop the spindle motors of the plurality of disk drives on which a data group mapped to the ~~second~~ first inner logical volume to be changed in response to the change-over indication and having the redundant relation is written.

13. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, further comprising

judging by the channel adapter whether the spindle motors of the plurality of disk drives are being operated or not, on which disk drives the data group mapped to the ~~other~~ second inner logical volume designated by the change-over indication and having the redundant relation is written,

causing by the channel adapter the operation of the spindle motors to continue, if the spindle motors are being operated, and

causing by the channel adapter to operate the spindle motors of the plurality of disk drives on which the data group mapped to the ~~other~~ second inner logical volume and having the redundant relation is written, if the spindle motors are not operated.

14. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, wherein if one mapped to the ~~other~~ second inner logical volume mapped to another first upper logical volume provided to the upper device exists in the plurality of disk drives on which ~~[[the]]~~ a data group mapped to the ~~second~~ first inner logical volume to be changed in response to the change-over indication and having the redundant relation is written,

the channel adapter causes the operation of the plurality of disk drives to be continued, on which disk drives the data group mapped to the ~~second~~ first inner logical volume to be changed in response to the change-over indication and having the redundant relation is written.

15. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, wherein if one mapped to the ~~other~~ second inner logical volume mapped to another first upper logical volume provided to the upper device does not exist in the plurality of disk drives on which ~~[[the]]~~ a data group mapped to the ~~second~~ first inner logical volume to be changed in response to the change-over indication and having the redundant relation is written,

the channel adapter causes to stop the operation of the plurality of disk drives on which the data group mapped to the ~~second~~ first inner logical volume to be changed in response to the change-over indication and having the redundant relation is written.

16. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, wherein in the case ~~that kind of~~ the command sent from the upper device to the second upper logical volume ~~for control~~ is a write command,

the channel adapter writes the content of the write command on the second upper logical volume ~~for control~~, and

judges the content of the write command to be the change-over indication.

17. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, wherein in the case ~~that kind of~~ the command sent from the upper device to the second upper logical volume ~~for control~~ is a read command,

the channel adapter judges the content of the read command to be the configuration information,

reads the configuration information from the memory, and

sends the read configuration information to the upper device.

18. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, wherein the storage control device includes a mapping change device, the mapping change device causes the ~~other~~ second inner logical volume instead of the ~~second~~ first inner logical volume to map to the first upper logical volume in response to an indication of the channel adapter.
19. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, wherein the storage control device includes a power control device, the power control device causes to stop the spindle motors of the plurality of disk drives on which ~~[[the]]~~ a data group mapped to the ~~second~~ first inner logical volume to be changed in response to the change-over indication and having the redundant relation is written, in response to an indication of the processor of the channel adapter, and causes to operate the spindle motors of the plurality of disk drives on which the data group mapped to ~~the~~ other second inner logical volume and having the redundant relation is written.
20. (Currently Amended) The method for controlling a storage control device as set forth in claim 11, further comprising
judging by the channel adapter the command sent from the upper device to be a command concerning writing or reading of data, in the case that the command sent from the upper device is addressed to the first upper logical volume, and
judging by the channel adapter the command sent from the upper device to be a command concerning the control information, in the case that the command sent from the upper device is addressed to the second upper logical volume ~~for control~~.